

HEATED SHOE

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a shoe structure, and more particularly to a heated shoe, which generates heat by using hydrocarbon reaction with oxygen.

2. The Related Art

[0002] Conventionally, people living in cold regions make shoes by warm furs. However, costs of the fur materials are high. These shoes only function to keep heat from dissipation into the cold environments and cannot generate heat to remain warm temperature inside the shoe.

[0003] US Patent Number 4,023,282, entitled "Heated Boot", discloses an improved hunting boot comprising an overshoe including one or more panels fitted to the contour of the foot from ankle to toes adapted to overlie the wearer's foot, and a sole member extending from the wearer's heel to toes, generally contoured thereto and adapted to underlie the foot. A thermal sleeve over-fits at least the portion of the overshoe housing the toes of the wearer and is adhesively secured to the sole member thereof. A catalytic warmer may be removably mounted in the pocket defined between the thermal sleeve and the at least one panel of the overshoe.

[0004] US Patent Number 4,674,199, entitled "Shoe with Internal Foot Warmer", discloses a shoe with an internal warming mechanism. The warming mechanism includes an electrical resistance coil for converting electrical energy to thermal energy. The source of electrical energy for the mechanism includes an electrical power generator, which is coupled to a mechanical transducer to convert movements of the wearer's foot into electrical energy. However the shoe cannot generate electrical energy converted into thermal energy for the wearers of no walking for long periods in the cold weather.

[0005] US Patent Number 4,756,095, entitled "Foot Warmer for Shoe", discloses a foot warmer mechanism which has a pair of sole plates in rubbing frictional contact with the upper sole plate pivotally secured at the toe of the shoe and the lower sole plate supported by a lever arm located near the heel of the shoe. A resilient spring is

provided at the heel of the shoe to bias the pair of plates upwardly. The pair of plates is moved down and up by the applied weight of the wearer and the countering bias of the spring. As the sole plates are moved, they slide against each other and generate heat by friction to warm the wearer's foot. However the shoe cannot generate thermal energy for the wearers not walking for long periods in the cold weather.

[0006] US Patent Number 4,823,482, entitled "Inner Shoe with Heat Engine for Boot or Shoe", discloses an inner shoe for a boot such as a ski boot which includes a foot warmer mechanism having a heat engine which includes a compressor, evaporator and condenser coils and interconnecting conduits for circulating a working refrigeration fluid. However, the elements of the shoe are complicated.

[0007] In addition, some of the conventional heated shoes use batteries as a power source to generate thermal energy. Due to the limitations of high power consumptions, short use time, long charge time and heavy batteries, they are not suitable to use outdoors but indoors.

SUMMARY OF THE INVENTION

[0008] The present invention relates to a heated shoe, which generates heat by using hydrocarbon reaction with oxygen. The features of the present invention include: keeping warm for long periods, giving out heat by itself, apparatus simple and low price of element materials.

[0009] A heated shoe in accordance with the present invention comprises a shoe body having at least a vent hole and at least a temperature control valve. The interior of the shoe body is provided with a recess inserted with a partition having a through hole. The partition divides the recess into two areas, one for receiving a fuel vessel of volatile fuel and the other for receiving an activated thermal conductor. The gas volatilized from the fuel penetrates through the through hole of the partition. The volatilized gas reacts with oxygen contained in the air entering from the vent hole to generate heat under the catalysis of the activated thermal conductor. The generated heat is transferred through a thermal pad to the whole shoe.

[0010] The principle of the present invention is to apply a little electrical power to heat the catalyst of the activated thermal conductor to reaction temperature thereof to expedite the reaction of the volatile fuel and the oxygen and thus to generate heat.

The heat can be continuously generated in case of sufficient supply of the volatile fuel, oxygen and catalyst. If stop the oxygen supply by the temperature control valve, the heat generation is terminated.

[0011] The present invention will be apparent to those skilled in the art after reading the detailed description of the preferred embodiment thereof in reference to the accompanying drawings, wherein

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Figure 1 is a side elevational view of a heated shoe constructed in accordance with a preferred embodiment of the present invention;

[0013] Figure 2 is a cross-sectional view of the heated shoe of the present invention;

[0014] Figure 3 is an exploded view of the heated shoe of the present invention; and

[0015] Figure 4 is a perspective view of an activated thermal conductor of the heated shoe of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0016] Referring to the drawings and in particular to Figure 1, a heated shoe in accordance with the present invention comprises a shoe body 100 defining at least a vent hole 110 and at least a temperature control valve 111 mounted to a sole of the shoe 100.

[0017] Also referring to Figures 2, 3 and 4, the interior of the shoe body of the present invention is further provided with a recess 120 defined in the sole with a partition 121 defining a through hole fixed in the recess 120. The partition 121 divides the recess 120 into two areas, one for receiving a fuel vessel of volatile fuel 130 and the other for receiving an activated thermal conductor 140. The activated thermal conductor 140 comprises at least a catalyst 141, a heating filament 142, a plurality of conducting wires 143 and at least a thermal conducting plate 144. In cooperating with the catalyst 141 of the activated thermal conductor 140 heated to the reaction temperature thereof by energized with a little amount of electrical power, gas volatilized from the volatile fuel 130 penetrates through the through hole of the

partition 121 and reacts with oxygen contained in the air entering from the vent hole 110 to generate heat under the catalysis of the catalyst 141. The generated heat is transferred through a thermal pad 150 to the whole shoe. The heat can be continuously generated in case of sufficient supply of the volatile fuel 130, oxygen and catalyst 141. If the temperature control valve 111 is closed, thereby cutting off the supply of air into the shoe 100, the heat generation is terminated. An example of the volatile fuel 130 is hydrocarbons. The vent hole 110 can be further covered with a penetrated fabric to stabilize the heat generation reaction. In addition, the shoe body 100 of the present invention can be further provided with a fuel charge hole 112 for charging fuel into the fuel vessel, a power transmission hole 113 and a temperature indicator 114.

[0018] The catalyst 141 can be made of precious metals, such as platinum. The heating filament 142 is made of nickel. The conducting wires 143 connects a power supply, which can be arranged in the shoe body or positioned at the outside thereof. The power supplied from the outside of the shoe body can be transferred through the power transmission hole 113 by the conducting wires 143.

[0019] The above statement is only for illustrating the preferred embodiment of the present invention, and not for giving any limitation to the scope of the present invention. It will be apparent to those skilled in this art that all equivalent modifications and changes shall fall within the scope of the appended claims and are intended to form part of this invention.